total and partial ureterectomy encourage the belief that it will be more commonly done in the future. It seems proper to insist that total nephro-ureterectomy should be done in all cases in which the condition of the patient warrants it. The added risk of the operation is very slight if the general condition is even fair.

There are some cases of ascending infection in which the ureter becomes progressively larger from below upward. In such cases the extension to the kidney is by actual growth of the disease along the course of the ureteral wall. The separated urines may show only a slight degree of pyuria on the affected side, but the diagnosis is easily made by the thickened ureter vaginally, the vesical appearances, and by finding the bacilli. The treatment of the case will depend on the extent of the ureter involved. If a small portion only is diseased it may be possible to divert the ureter into the summit of the bladder and excise the lower portion, including the ureteral eminence and possibly a portion of the bladder, depending on the extent of the disease.

GONORRHŒAL VULVOVAGINITIS IN CHILDREN.

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The severe results of vulvovaginitis in the young are of sufficient importance to warrant a more careful study of the character and mode of infection of this disease. I think it is practically certain from looking over the different series of cases reported, and from a careful study of my own, that most of these cases of vulvovaginitis are gonorrhœal in nature. I think, moreover, it is equally certain from these same collected cases that this disease in children is of much greater danger than is commonly supposed, and that the results are sometimes appalling. That the greatest care and thoughtfulness should be exercised with a vaginal discharge in children, both in regard to the local treatment, the care of the eyes, and infection to others, I am sure all who have had these cases to deal with will agree. The medico-legal aspect of the case also makes it of great importance. The knowledge which we have of the superstitious belief among the poorer classes, especially among the negroes, that connection or attempted rape with a virgin will cure the gonorrhœa in a male, made many, before the fact of the facility of contagion from other sources was known, jump at the conclusion of rape, and even now there is no more delicate or difficult medico-legal problem with which physicians are called on to deal.

The publications of Pott, von Duche, and Spaeth, which first placed the so-called vulvovaginitis of infants among the gonorrhœal affections, have been followed by reports of many cases, the large majority of which are gonorrhœal. In 1885 Fränkel in 62 cases which he examined with the microscope found diplococci which resembled in appearance the gonococcus of Neisser. Cseri also in 26 cases which he reported discovered a diplococci, which led him to think that all his cases were gonorrhœal in origin, although his cultures and inoculations were practically negative. Morse reports 21 cases, in 16 of which he was able to demonstrate the gonococci to his own satisfaction; and Cohenbrach found the gonococci in 20 out of 21 of his cases. Suchard reports 12 cases due to infection by towels, all of which he believes were gonorrhœal; while Weil believes that he traced 30 of his cases to infection from a rectal thermometer.

Skutsch's article is very interesting as showing how easily the infection may travel. He reports 160 cases of vulvovaginitis contracted by using the free baths at Posen. All the children had most of the symptoms of gonorrhœa, intense pain on urination, and in some of the cases there were marked constitutional symptoms. The bathing water was not changed frequently, and several children bathed together in the same tub. Dr. Steinschneider examined the discharge from 140 cases, and in 60 of them found gonococci. He came to the conclusion that all of the cases were gonorrhœal in origin.

In a large number of cases that Pott reported he considered that the origin of most of them was gonorrhœal; 1 in 8 of his cases had congenital syphilis, while only 3 in 86 cases followed attempts at rape.

O'Donavan makes the statement that in vulvovaginitis among negro children the slide invariably shows gonococci. Williams found the gonococci of Neisser in 4 out of 5 cases that he reports. Atkinson discovered 6 cases, all sleeping in the same dormitory, in an institution. Close questioning of some of the larger girls revealed the fact that they had been titillating the genitals of the smaller girls. In a year the institution was pervaded by a contagious ophthalmia. He comes to the conclusion that the vulvitis was caused by the ophthalmia, and not *vice versa.* Martin inoculated the pus from an infant, suffering from vulvovaginitis, into the urethra of a man; a severe gonorrhœal urethritis followed.

With such an array of testimony it would seem certain that the great majority of all cases of vulvovaginitis in children are of gonorrhœal origin. We must remember, however, that the mere finding of diplococci in the vaginal discharge is by no means positive. There is a great variety of diplococci in the vaginal secretion, as Bumm has shown; and while there is very little doubt, from the symptoms and microscopic findings, of the gonorrhæal origin of most of the reported cases, still the doubt does remain until the gonococci in each case have been cultivated and inoculated.

In regard to the other causes of this disease, the following classification is, I think, sufficient:

- Catarrhal.
  - Filth.
  - Exanthemata.
- Traumatic.
  - Rape.
  - Masturbation.
  - Mechanical injury.
- Infectious.
  - Oxyurides.
  - Bacteria, pathogenic.

Atkinson lays down ulcerative stomatitis as a cause. Sheffield thinks that masturbation is a result more than a cause.

I can find very few cases where there was a coexistence of the oxyuris vermicularis, and none in which they have been definitely proven to have been the original cause. There is no doubt that they sometimes are the exciting cause, just as a scrofulous diathesis, filth, etc., may start the disease; but they are certainly rare compared to the gonorrhœal origin.

Gonorrhœal vulvovaginitis apparently can be contracted from towels, bathing vessels, sheets of the bed, etc., as has been shown from the cases above reported, the unprotected and prominent vulva in children seeming to be an easily accessible position for the inroads of the gonococci. Currier believes that an infant may be infected by its mother during parturition. This, I think, has occurred in the second case I report. Matin reports that a girl, aged six years, who contracted gonorrhœal ophthalmia from her older sister—with whom she slept and who was suffering from a vulvovaginitis—by sliding down on the sheets and getting the eye infected in this manner.

The microscope is the only means of telling the infectious from the non-infectious, and it is a good rule, as Williams suggests, to consider all cases infectious.

The symptoms seldom vary, and are generally typical. The vulva is bathed in a yellowish or whitish, thick discharge, which on pressure seems to exude from the vagina. The vulva and vagina in advanced cases are swollen, red, and painful on pressure. There is a slight rise in temperature, and constitutional symptoms sometimes are marked. Painful urination is not a constant symptom, although I think that the urethra is involved in infantile vulvovaginitis as often perhaps as in gonorrhœa of the older women. In my Cases II. and IV. there was painful urination, although in Case II. it was rather uncertain. In Sheffield's table, out of 65 cases 13 presented severe symptoms of ardor urinæ. Cystitis is perhaps a rare symptom, although Cohenbrach, Comby, and Reblaud report it as a complication in some of their patients. Ophthalmia is the most common of all the complications. In Leszynsky's report, 18 children out of 35 contracted purulent ophthalmia. It occurred in none of my cases. Heart lesions are sometimes found accompanying vulvovaginitis, and arthritis, according to Storer, is quite common in the gonorrhœal form of this disease.

Hartly tells us of a patient of his—a girl, aged five years, suffering from a purulent vulvovaginitis—whose ankle became much swollen and presented all the appearances of gonorrhœal rheumatism. He also reports four other cases of rheumatism in children suffering from vulvovaginitis, and in one of these cases gonococci were found in the fluid from the joint.

The most severe and dangerous complication of infantile vulvovaginitis, however, is acute peritonitis, caused by the ascent of the infection up the uterus and tubes into the peritoneal cavity. Many cases of this kind have been reported. Stevens reports a case of a child, aged four years, suffering from a vaginal discharge, developing all the symptoms of acute peritonitis. The child soon went into collapse, and died. The leucorrhœal discharge he found by questioning to have been present for some time. Huber describes the case of a girl, aged seven years, who was suffering from a vaginal discharge; no microscopic examination was made. She developed symptoms of peritonitis. The diagnosis of ruptured appendix was made, but the operation revealed a normal appendix. There was general peritonitis, and the right tube was very much thickened and inflamed, evidently the channel by means of which the infection had travelled. He also saw a girl, aged eleven years, with an exquisitely tender and enlarged ovary and tube, who was suffering from a vaginal discharge. Sänger gives an instance of a girl, aged three years, who had peritonitis in consequence of gonorrhœal vulvovaginitis. Caille has seen a case, in an infant, aged five months, whose father was suffering from gonorrhœa. The child, who had ophthalmia and vulvovaginitis, finally developed peritonitis and died. There is very little question that in all these cases peritonitis was caused by the infection starting from the vulvovaginitis. Max found pus in the Fallopian tubes of children three times at autopsies. Sänger is perhaps right when he states that the cases of unexplained pelvic disease in virgins can be referred back to an infantile salpingitis that remained quiescent until puberty —an infantile salpingitis that owed its origin to a vulvovaginitis.

Sterility is in some women due to the same cause; and I think we will all agree with Currier when he says "it seems probable that many of the deformed and underdeveloped uteri with which are associated so much dysmenorrhœa, etc., are the consequence of infantile vulvovaginitis."

With all these complications and insidious sequelæ, how frightful the disease becomes. It is not merely a mild secretion which is caused by a cold or slight inflammation, and warranted to recover in a few days or weeks; it is a disease which bears grave and serious dangers, and should not be passed over lightly, but should be watched with the most faithful vigilance and precaution, and fought, step by step, until it is entirely eradicated and no doubt remains as to a complete cure.

In regard to treatment, I found the following very satisfactory in my cases: Cleanliness was enforced and proper hygiene attempted. The children were given small doses of quinine or syrup of the iodide of iron, three times daily. Strict attention was also paid to the bowels. Potassium permanganate was used in all the cases. A solution of 1:1200 to start with was used slowly through a rubber catheter; this was gradually increased until a strength of 1:2000 was reached. The douches were given twice daily, the genitals being thoroughly cleansed with soap and water before each treatment, and powdered boric acid was introduced into the vulva and blown into the vagina with a powder-blower after each douche.

Currier uses nitrate of silver, 2 per cent., in gonorrhœal forms. Storer advises that the infant of a gonorrhœal mother should have the genitals protected as well as its eyes, and should not be allowed to sleep with its mother. He thinks the greatest care should be taken to prevent ophthalmia, even to confining the hands; and the eyes, besides being washed with soap, should be washed in a bichloride of mercury solution every morning, as they are more liable to become affected during the night. Sheffield believes that the only preventive for ophthalmia is binding the eyes at night, and that nitrate of silver, 10 grains to the ounce, is an excellent abortive in the early stage of lacrymation. Pott advises bougies of iodoform; Pozzi, insufflation of iodoform; while Marfau uses bougies of alumnol, 2 per cent.

The histories of my own cases are as follows:

Case I.—M. F., aged three years. Three months ago her mother noticed a profuse discharge, which had caused a great deal of irritation and discomfort. The child's undergarments were constantly soiled and stained. Examination revealed the labia reddened and swollen, bathed in a white, thick discharge. There were no symptoms of infection of the urethra.

Case II.—H. C., aged three months. The child has a vulvovaginal discharge, which has been present since birth. The mother thinks that urination gives the child some pain, as she cries when she performs the act. Vagina exudes a thick, yellowish discharge, which bathes the vulva. The mother was examined and found to have a vaginal discharge and some slight urethral discharge. The discharge of the mother was examined for gonococci, but none could be found. She admits that her husband suffered from gonorrhœa some time before her child was born, but is uncertain in regard to the date; moreover, she states that her labor was a very difficult one, and she thinks "that the child was born feet foremost." I think it is probable that it was a breech presentation, and that the child was infected at birth.

Case III.—A. W., aged eight years; has had a vulvar discharge for two weeks. Her symptoms and the examination were similar to the other cases.

Case IV.—M. W., aged ten years; is a sister of Case III. She has had a vulvovaginal discharge for three weeks. She has always slept with her younger sister. Both these children were brought to see me by the mother, who thought rape had been attempted. She thinks that her son, who is eighteen years of age, has gonorrhœa, but of this she is not positive. I think the elder girl was infected either by a utensil or a cloth of some kind, and in turn infected her sister, with whom she slept.

Case V.—F. H., aged four years; has suffered from vulvar discharge for three weeks; some pain on urination. The mother says that two weeks ago the child had inflamed eyes; when she presented the child for examination, however, there was no evidence of ophthalmia.

I will now state the results obtained from the cultures and the microscopic examination of these cases.

The test of the gonococci in the cultures is their growth on a medium of hydrocele fluid and agar and their refusal to grow on plain agar. This procedure was attempted in every case except one. How successful was the result the following will show:

In Case I. the discharge was stained with gentian violet. Diplococci were present, which were decolorized by Gram's solution. Cultures were attempted in agar and hydrocele fluid and a growth obtained. This was examined and found to contain diplococci, which were decolorized by Gram's method. A growth was obtained on agar, however, which makes the diagnosis uncertain. I still believe the gonococci to have been present mixed with some other organism, which developed on the plain agar.

In Case II. diplococci were found which were not typical. No growth was obtained on hydrocele agar. This case I consider negative.

In Cases III. and IV. the result was absolutely positive. Gonococci were found, which were decolorized by Gram's solution, and typical cultures were obtained on hydrocele agar, but no growths took place on plain agar. I consider both these cases to be gonorrhœal.

In Case V. examination of the discharge showed diplococci in the cells, and they were decolorized by Gram's method. This patient was to return for a culture, but, unfortunately, disappointed us and remained away. Although the cultures were not obtained, I consider the case to be gonorrhœal in nature.

In consideration of the difficulty in growing gonococci and the liability of a mixed infection, I think the probability is that all the cases I report were suffering from gonorrhœal vulvovaginitis; however, the results obtained in the laboratory are the only positive ones, and show that out of five cases two were proven to have gonorrhœal vulvovaginitis, one was uncertain, one was negative, and in the other no culture was made.

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